

COPY OF PAPERS
ORIGINALLY FILED

#3
CFR
Page 1 of 3



UNITED STATES PATENT AND TRADEMARK OFFICE

APR 22 2002

COMMISSIONER FOR PATENTS
UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. 20231
www.uspto.gov

APPLICATION NUMBER	FILING DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	DRAWINGS	TOT CLAIMS	IND CLAIMS
09/863,935	05/26/2001	2641	950	2001P08524US	1	16	6

DATA
ENTERED

Siemens Corporation
Att: Elsa Keller, Legal Administrator
Intellectual Property Department
186 Wood Avenue South
Iselin, NJ 08830

RECEIVED

JUL 24 2001

INTELLECTUAL PROPERTY
DEPARTMENT

CONFIRMATION NO. 9993

FILING RECEIPT



OC000000006321863

Date Mailed: 07/20/2001

Receipt is acknowledged of this nonprovisional Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please write to the Office of Initial Patent Examination's Customer Service Center. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).

Applicant(s)

Christoph A. Aktas, Augsburg, GERMANY; ✓
John W. Yates, Mountain View, CA; ✓
Phillip C. Meredith, Palo Alto, CA; ✓

RECEIVED

APR 24 2002

Technology Center 2100

Assignment For Published Patent Application

SIEMENS INFORMATION AND COMMUNICATION NETWORKS, INC;

Domestic Priority data as claimed by applicant

Foreign Applications

If Required, Foreign Filing License Granted 07/19/2001 ✓

Projected Publication Date: 11/28/2002

Non-Publication Request: No

Early Publication Request: No

Title

Methods and apparatus for accessing and processing multimedia messages stored in a unified ✓

RECEIVED

MAY 02 2002

Technology Center 2600

multimedia mailbox

Preliminary Class
704

Data entry by : ASRAT, FANAYE

Team : OIPE

Date: 07/20/2001

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000

**LICENSE FOR FOREIGN FILING UNDER
Title 35, United States Code, Section 184
Title 37, Code of Federal Regulations, 5.11 & 5.15**

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Office of Export Administration, Department of Commerce (15 CFR 370.10 (j)); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

PLEASE NOTE the following information about the Filing Receipt:

- The articles such as "a," "an" and "the" are not included as the first words in the title of an application. They are considered to be unnecessary to the understanding of the title.
- The words "new," "improved," "improvements in" or "relating to" are not included as first words in the title of an application because a patent application, by nature, is a new idea or improvement.
- The title may be truncated if it consists of more than 500 characters (letters and spaces combined).
- The docket number allows a maximum of 25 characters.
- If your application was submitted under 37 CFR 1.10, your filing date should be the "date in" found on the Express Mail label. If there is a discrepancy, you should submit a request for a corrected Filing Receipt along with a copy of the Express Mail label showing the "date in."
- The title is recorded in sentence case.

Any corrections that may need to be done to your Filing Receipt should be directed to:

Assistant Commissioner for Patents
Office of Initial Patent Examination
Customer Service Center
Washington, DC 20231

SIEMENS Corporation

IPD-West Coast
186 Wood Avenue South
Iselin, NJ 08830



COPY OF PAPERS
ORIGINALLY FILED

PATENT APPLICATION
Attorney Docket No. : 2001P08524US

Express Mail Label No.: EL395673095US
Date of Deposit: 22 MAY 2001

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

THE ASSISTANT COMMISSIONER FOR PATENTS
Washington, D.C. 20231

TRANSMITTAL LETTER FOR NEW APPLICATION

Sir:

Transmitted herewith for filing is a(n) ☒ Original patent application.
☒ Utility ☐ Design ☐ Continuation-in-part application

INVENTOR(S): Christoph A. Aktas, John W. Yates and Phillip C. Meredith

TITLE: METHOD AND APPARATUS FOR ACCESSING AND PROCESSING MULTIMEDIA
MESSAGES STORED IN A UNIFIED MULTIMEDIA MAILBOX

Enclosed with this transmittal (submitted in duplicate) are the following:

- ☒ Twenty-four (24) page specification.
☒ One (1) sheets of drawings ☐ formal drawings ☒ informal drawings (one set)
☒ The Declaration and Power of Attorney ☒ signed ☐ unsigned
☒ An Assignment Transmittal and Assignment to SIEMENS INFORMATION AND COMMUNICATION NETWORKS, INC.
☐ Information Disclosure Statement with PTO1449 and () references.
☒ Filing fee has been calculated as shown below (other than small entity):

For	Number Filed	Number Extra	Rate	Additional Fees
Total Claims	16 - 20	= 0	x \$ 18	\$ 0.00
Indep. Claims	6 - 3	= 3	x \$ 80	\$ 240.00
<input type="checkbox"/> First Presentation of a Multiple Dependent Claim			x \$270	\$ 0.00
			Basic filing Fee	\$710.00
			Total	\$950.00

Please charge my Deposit Account No. 19-2179 in the amount of \$950.00. The Commissioner is hereby authorized to charge any fees that may be required, or credit any overpayment to Deposit Account No. 19-2179 pursuant to 37 CFR 1.25. A duplicate copy of this sheet is enclosed.

PLEASE MAIL CORRESPONDENCE TO:
Siemens Corporation
Attn: Elsa Keller, Legal Administrator
Intellectual Property Department
186 Wood Avenue South
Iselin, NJ 08830

Respectfully submitted,

Tracy L. Hurt
Attorney for Applicant(s)
Reg. No.: 34,188
Date: May 15, 2001
Telephone: 408-492-7324

Express Mail Label No.: EL395673095US
Date of Deposit: 22 MAY 2001



**COPY OF PAPERS
ORIGINALLY FILED**

Atty Docket No.: 2001P08524US

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

This is a U.S. Patent Application for:

Title: METHODS AND APPARATUS FOR ACCESSING AND
PROCESSING MULTIMEDIA MESSAGES STORED IN A
UNIFIED MULTIMEDIA MAILBOX

Inventor #1: Christoph A. Aktas
Address: Kühbacher Weg 1, D-86154 Augsburg, Germany
Citizenship: Germany

Inventor #2: John W. Yates
Address: 106A Kittoe Drive, Mountain View, CA 94043
Citizenship: USA

Inventor #3: Phillip C. Meredith
Address: 459 Homer Avneue #6, Palo Alto, CA 94301
Citizenship: USA

IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE
PATENT APPLICATION

5 METHODS AND APPARATUS FOR ACCESSING AND
PROCESSING MULTIMEDIA MESSAGES STORED IN
A UNIFIED MULTIMEDIA MAILBOX

BACKGROUND OF THE INVENTION

10 1. Field of the Invention

The invention relates to methods and apparatus for processing multimedia messages. More particularly, the invention relates to methods and apparatus for

- 15 (1) converting messages from one medium to another;
(2) performing message content analysis; (3) utilizing linguistically based analysis tools to identify message relationships regardless of media type; (4) interrelating messages according to content; and (5) providing a simple
20 message reference capability to simplify message access.

2. Brief Description of the Prior Art

Business people receive many different kinds of messages, e.g. electronic mail, voice mail, fax, video
25 messages, attachments to electronic mail. It is possible and desirable to have all messages sent to a single mail box from which they may all be retrieved regardless of the message type. However, the only retrieval device which is capable of reading all of these different types
30 of messages is a personal computer having a graphical display and audio video capability. Unfortunately, it is

not always possible or convenient to retrieve messages
with a personal computer.

A unified mailbox where all kinds of media
5 (voice, fax, e-mail, and video) are made accessible
and/or visible from virtually anywhere to a subscriber or
user in one basket is a convenient means of communication
when compared to handling multiple mailboxes with
distinct media. Current solutions for a unified mailbox
10 are inefficient, however, for someone with an intense
communication style and a frequent need to handle his/her
messages remotely. The mismatch of media type of the
information and the capabilities of the various (often
limited) devices used for remote access places a heavy
15 burden on the user and the interface of the system. This
is especially true for the interfaces utilizing a
telephone with no display, or handheld devices with
limited display capabilities.

20 Some of the problems arise in the context of
compound and/or lengthy messages in connection with one
or the other access means. For example, it is not
possible to deliver voice and fax messages to a text-only
e-mail capable device. It is also difficult to deal with
25 lengthy e-mails delivered to a voice-only interface or to
a text-interface with limited capabilities. Even when
the device has a fully functional GUI interface, there is
room for increased efficiency with large amounts of data.

It is a challenge to efficiently-present the information in various office document formats (e.g., Word Processor, Spreadsheet, and Presentations) associated with a message. It is often difficult to locate and visually
5 present related messages and attachments. When the mailbox has many messages in it, it is difficult to reference the messages.

Other problems arise due to the increased
10 amount of information the unified mailbox can provide. Current mechanisms for organizing and presenting relationships among messages (listing by arrival time, subject, sender, etc.) are insufficient for a large number of messages of varying media and, especially,
15 mixed media within a given message.

It would be desirable to provide a flexible, media independent way of finding and navigating related messages. With current systems, for example, the user is
20 unable to recognize that there is a relationship between a voice message and a fax without listening to the voice message and displaying/printing the fax.

Because the presentation of unified mailbox
25 information is more complex, especially if relationships as described hereinabove are incorporated into the presentation, identifying an individual item (message or message attachment) for further action can become

problematic. How does the client/user identify to the server which message is to be acted upon? Are the entire message and its attachments to be involved? Is it a single attachment or only the original message body? And
5 if the messages are presented in a "graph" format, how does the user select an individual item?

Current unified mailbox systems offer media sensitivity for message retrieval only when accessed with
10 a graphical user interface (GUI) from a PC client. If a particular media or office document is attached to an e-mail, the user needs to click-on it in order to launch a specific application, for example, an audio player for voice, tiff-viewer for fax, video player to view a video
15 message, etc.

For users with intense communication requirements (e.g. executives or customer service agents who receive hundreds of compound messages daily) there
20 are no means to quickly process inbox messages except by the sender information, the subject line, and maybe few lines of the message body. In order to read messages, the user has to click on or mark a certain item in a graphical interface in order to get to the message body.

25

No content summarization of lengthy text messages or respective attachments is available yet that would remarkably improve the efficiency of handling the daily information avalanche in the office.

Current mailbox searching does not provide visual display of content and temporal relationships. No search capability exists yet for non-text messages.

5

If a unified mailbox is accessed from a telephone interface, voice and e-mail messages are retrievable and the user can listen to both. Existing text-to-speech technology provides a means to convert the e-mail to voice. A fax message can be forwarded to a fax machine or printer.

However, if an e-mail contains an attachment, the systems are able to indicate that, but are unable to access its content. Similarly, the contents of a fax or other documents attached to an e-mail are indicated but not accessible to the user accessing the mailbox with a telephone interface.

20

If an e-mail is lengthy, the user may be able to navigate through it by accelerating the text-to-speech reading speed. However, there is no means of text content summarization applied to shorten the process without eventually losing/skipping critical content.

If messages are forwarded to a handheld device via a wireless service but the device has limited text-display capabilities only certain parts of the email (From, Subject and a limited number of characters of the message body) can be displayed. If the critical information in the message is not in the beginning of the message body that is displayed, it is "lost" to the recipient. He/she has to use other access methods or make a call into the messaging system/server to retrieve the full text message (by listening to it or by initiating a printing to a device nearby).

As mentioned above, voice and other media attachments are indicated but not transmitted and/or displayed on a text-only display. The user needs to use other access methods to retrieve the messages. Additionally, no text content summarization methods are utilized to deal with access device technology limitations.

Full message sensitivity is only provided when accessing a mailbox with a multimedia PC. However even multimedia PCs lack any means to summarize message content in order to make it more efficient for the recipient to read his/her lengthy messages. Also, there are yet no means to summarize content of attached documents.

When accessing a mailbox with a telephone, the media and device sensitivity is limited to voice and e-mail. Again, no techniques of text content summarization are applied yet in order to make the retrieval of the message information over the phone more convenient.

In the case of handheld or mobile devices with limited text-display capabilities, the problem is that lengthy messages are usually not transmitted in their entirety by the wireless/paging service providers. Additionally, any other media attachments are "lost". No content summarization of lengthy text messages or respective attachments is available yet that would remarkably improve the efficiency of handling the daily information avalanche in the office.

SUMMARY OF THE INVENTION

5 It is therefore an object of the invention to provide methods and apparatus for accessing multimedia messages from a unified mailbox.

10 It is also an object of the invention to provide methods and apparatus for converting media types in a unified multimedia mailbox.

15 It is another object of the invention to provide methods and apparatus for summarizing the content of messages in a unified multimedia mailbox.

20 It is yet another object of the invention to provide methods and apparatus for cross referencing related messages based on content.

 It is another object of the invention to provide methods and apparatus for improved handling of email attachments.

25 It is still another object of the invention to provide methods and apparatus for customizing mail handling based on a system profile adapted to the device used to access the mailbox.

In accord with these objects which will be discussed in detail below the apparatus and associated methods of the invention include a mail server that provides multimedia message inbox for one or several
5 users on a network; a subsystem that detects media attachments to messages in a mailbox; a subsystem that converts media attachments into another media type using text-to-speech, fax-to-text, video voice track into text and speech-to-text; a subsystem that analyzes and
10 summarizes the text content of original or converted media in respect of the linguistic meaning; a subsystem that delivers appropriate media according to an access device and message purpose, as defined in a profile; a subsystem that identifies cross-media interrelationships
15 between messages and controls the media conversions necessary for this analysis; and a subsystem that controls a reference number scheme.

The methods and apparatus of the invention
20 solve the problems discussed above by utilizing advanced media conversion methods, analysis and summarization of message content, and intelligent forwarding concepts. It provides access device and media sensitive intelligence for a mailbox when retrieving or forwarding a particular
25 message.

The concept of media conversion is extended beyond text-to-speech to other attachments; a speaker-independent, large vocabulary, telephony-quality speech recognition engine is utilized to convert a voice message to text or to convert the voice track of a video attachment into readable text. Similarly, fax information is converted into text.

10 According to the invention, the content of messages is automatically summarized. The summarization of a message content is an improvement toward efficiency, particularly in the case of a forwarded lengthy message to a handheld device with limited display capabilities. 15 The same is true for reading a lengthy message over the phone. Summarization is also applied to attached media (e.g. fax, Word document) extends even the media content accessible.

20 Both, the media conversion and the content summarization applied together provide compatibility with the access device. Depending on the user, the types of potential access devices are usually predefined; therefore messages along with their attachments that form 25 the message content can be tailored to those devices while accessed or forwarded according to a profile. This ensures the availability of more information to the recipient at the device of choice and that is probably

most convenient. Still, if the user requires more information, he/she can utilize another access method.

The invention also provides cross-media
5 searching and visual displaying. Often messages related to a specific topic of interest to the user are in different media and spread throughout the message store (e.g. in different folders). The cross-media search finds these messages and presents them to the user in a
10 way that makes the content and time relationships clear allowing efficient use of the otherwise overwhelming amount of information. The search engine utilizes sophisticated linguistically based analysis tools to discover the message relationships.

15

Additionally, a reference number scheme for all messages is provided. All messages in a particular group of messages of interest to the user are assigned a reference number to be used in further actions. Thus a
20 PDA user can, for example, get a summary of messages with reference numbers and an indication of the message type. This reference number may then be used to access that message, and through it, a particular attachment to that message for further. Voice commands may be used to
25 invoke actions on items more efficiently using the reference numbers of messages.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a high level block diagram of a multimedia mail system according to the invention.

5

DETAILED DESCRIPTION

Turning now to Figure 1, an integrated multimedia messaging system according to the invention includes a mail server 10 that provides multimedia message inbox for one or several users on a network; a mail processor 11; a subsystem 12 that detects media attachments to messages in a mailbox; one or more subsystems that converts media attachments into another media type using text-to-speech 14, fax-to-text 16, video voice track into text 18 and speech-to-text 20 a subsystem 22 that analyzes and summarizes the text content of original or converted media in respect of the linguistic meaning; a subsystem 24 that delivers appropriate media according to an access device and message purpose, as defined in a profile; a subsystem 26 that identifies cross-media interrelationships between messages and controls the media conversions necessary for this analysis; and a subsystem 28 that controls a reference number scheme.

The invention can better be understood through an illustrative example such as the notification of a single-media voice message to a data pager. The following describes an example of this process involving a user that has a multimedia mailbox and a data pager who receives a voice message.

The problem is to provide the "best" information to the pager so the user can proceed most efficiently. What is the "best" information will vary according to the user's actual preferences, but will most likely include sender identification and meaningful portions of the message itself. In addition, there are probably messages the user would prefer to delay any handling of until an appropriate device is available. Thus the steps for sending voice messages to a pager would include: a) filtering messages to be processed, b) speech-to-text conversion, c) summarization and post filtering, and d) selection and delivery of text information to the device.

Since the resources involved in processing a message may be large, messages are pre-filtered. Speech-to-Text is "expensive" in its use of resources. Interrupting the user with any but the most important messages can be an unnecessary expense of the user's time and attention as well as a waste of system resources.

Thus a mechanism to prevent the presentation of a message to a given device is important. This filtering is based on a variety of data including sender, message priority, etc. and the criteria for filtering is stored in the
5 system profile for the user.

Voice messages which pass through the pre-filter are converted to text. This is most efficiently accomplished on the server side, perhaps with a dedicated
10 "helper" server explicitly for the server so as not to disturb other processing on the server. The resulting text message is then be associated with the original message (as the text message body or as a separate attachment).

15

Before sending the text message to the pager, it is subjected to post-conversion filtering and summarization. Post-conversion filtering is optional, preventing processing of messages that appear not to be
20 on a topic deemed important to the user. If it does not appear important, it would then remain in the mailbox to be processed. If the message survives the post-conversion filtering step, the text is then summarized.

25

Most simply, summarization includes reduction to a list of keywords and phrases found within the text. The summarization is created by removing from the message words/phrases not found within the user-defined list of

keywords/phrases. More complex summarization includes allowing the user to specify the keyword/phrase list based on the sender of the message.

5 Since the message is a speech-to-text conversion, the keywords and their homonyms should be checked. An option on the summarization, for example a check box that says "allow homonyms", could be utilized to enable this feature.

10 Even more complex summarization methods contemplated by the invention involve performing sophisticated grammatical parsing and analysis.

15 Data is transmitted to the pager based on a user defined data selection criteria which is stored as a template in the system profile for the user. The data available for selection includes sender name, time, summary, message priority, un-summarized text, and other
20 fields as available.

 The user describes a template that indicates the information desired and the number of characters of each field desired. For example:
25

 "From %SENDER% at %TIME%: %100SUMMARY%"

 indicates that the user wants a string that includes the

entire sender name, the received time and the first 100 characters of the summary to appear on his pager.

When the user receives the page, the summary
5 information gives him/her enough information to determine how critical the message is. If it appears critical, he/she may choose to access the entire message using a different device, e.g. a telephone.

10 Another example is the retrieval of text messages (such as email) via a telephone. Text messages are pre-filtered as described above. The text is then summarized. The summary is then converted to speech which is played on the telephone to the user calling in
15 for messages.

Still another example is sending a fax message to a PDA. Fax messages are pre-filtered based on sender and priority. The fax messages which pass through the
20 filter are converted to text with OCR (optical character recognition) software. The text is summarized. Data is selected using a user defined template. The text message is sent tot he PDA and the user is "notified".

25 In general, a user can define a "morphing process" for messages in the context of any particular target device such as a pager or a cell phone with a limited display.

The morphing process is a combination of message filtering, message restructuring, data conversion, data summarization, data selection and
5 notification steps that are configured to handle particular media types for particular target devices. Each user may define a set of rules and parameters for each device type defining how messages are morphed.

10 For example, a user may have a Voice Message-to-Pager morph definition that would do the following:

- 15 (a) filter messages based on sender and priority, removing from further processing (i.e. leaving on the server) messages that are not deemed urgent enough to disturb the user while out of the office;
- 20 (b) perform speech-to-text conversion;
- (c) summarize the text based on criteria defined by the user;
- 25 (d) perform further filtering based on the summarized/converted text;
- (e) organize the text in a template; and

(f) send the message to the pager.

In general, a morphing process will include these steps in some order determined by the user. In addition, message restructuring steps allow the user to handle multiple attachments of varying media attached to the message. For example, the user may select that a summary of the attachments be created (attachment name and media type) or may request that the attachments be expanded, converted and summarized as described above for the single media message.

There have been described and illustrated herein methods and apparatus for processing multimedia messages. While particular embodiments of the invention have been described, it is not intended that the invention be limited thereto, as it is intended that the invention be as broad in scope as the art will allow and that the specification be read likewise. It will therefore be appreciated by those skilled in the art that yet other modifications could be made to the provided invention without deviating from its spirit and scope as so claimed.

What is claimed is:

1. A multimedia mailbox system, comprising:

- 5 a) a message store for storing multimedia messages; and
- b) a plurality of data converters for converting
 messages in one medium to messages in another
 medium.

10

2. A system according to claim 1 wherein said plurality
of data converters includes at least two selected from
the group consisting of a text to speech converter, a
15 speech to text converter, and a fax to text converter.

3. A system according to claim 1 further comprising
means for linguistically based searching of multiple
20 message types and for linguistically relating multiple
messages of different type.

4. A system according to claim 1 further comprising
25 means for assigning a reference number to each message.

5. A multimedia mailbox system, comprising:

- 5
- a) a message store for storing multimedia messages; and
 - b) means for linguistically based searching of multiple message types and for linguistically relating multiple messages of different type.

10

6. A system according to claim 5 further comprising means for assigning a reference number to each message.

15 7. A multimedia mailbox system, comprising:

- a) a message store for storing multimedia messages;
- b) a plurality of data converters for converting
20 messages in one medium to messages in another medium;
- c) means for linguistically based searching of multiple message types and for linguistically relating
25 multiple messages of different type and
- d) means for assigning a reference number to each message.

8. A system according to claim 7 wherein said plurality
of data converters includes at least two selected from
the group consisting of a text to speech converter, a
5 speech to text converter, and a fax to text converter.

9. A method for managing a multimedia mailbox,
comprising the steps of:

10

a) storing messages of different types in a single
mailbox; and

15

b) automatically converting messages from one medium to
another.

10. A method according to claim 9 wherein said step of
converting includes at least two selected from the group
20 consisting of converting text to speech, converting
speech to text, and converting fax to text.

11. A method according to claim 9 further comprising the
25 step of linguistically searching multiple message types
and linguistically relating multiple messages of
different type.

12. A method according to claim 9 further comprising the step of assigning a reference number to each message.

5 13. A method for managing a multimedia mailbox, comprising the steps of:

a) storing messages of different types in a single mailbox; and

10

b) linguistically searching multiple message types and linguistically relating multiple messages of different type.

15

14. A method according to claim 13 further comprising the step of assigning a reference number to each message.

15. A method for managing a multimedia mailbox,
comprising the steps of:

- 5 a) storing messages of different types in a single mailbox;
- b) automatically converting messages from one medium to another;
- 10 c) linguistically searching multiple message types and linguistically relating multiple messages of different type; and
- 15 d) assigning a reference number to each message.

16. A method according to claim 15 wherein said step of converting includes at least two selected from the group
20 consisting of converting text to speech, converting speech to text, and converting fax to text.

ABSTRACT OF THE DISCLOSURE

The invention provides the user of a unified messaging mailbox with efficient, intelligent, media and device sensitive methods and apparatus to access and process (e.g., read, listen, forward, and search) messages. The invention introduces media conversion capabilities to selectively treat multimedia messages and message attachments so that they can be efficiently handled by mobile devices like PDAs (Personal Digital Assistants), pagers, or phone devices (with or without a text display feature). Furthermore, the invention introduces message content analysis capabilities that will recognize linguistic relationships between messages regardless of the media type. The invention also describes the ability to present these linguistic relationships along with the standard messaging relationships (Message arrival time, subject, sender, etc.). Still further, the invention introduces a message referencing option that allows simpler message selection from certain devices.

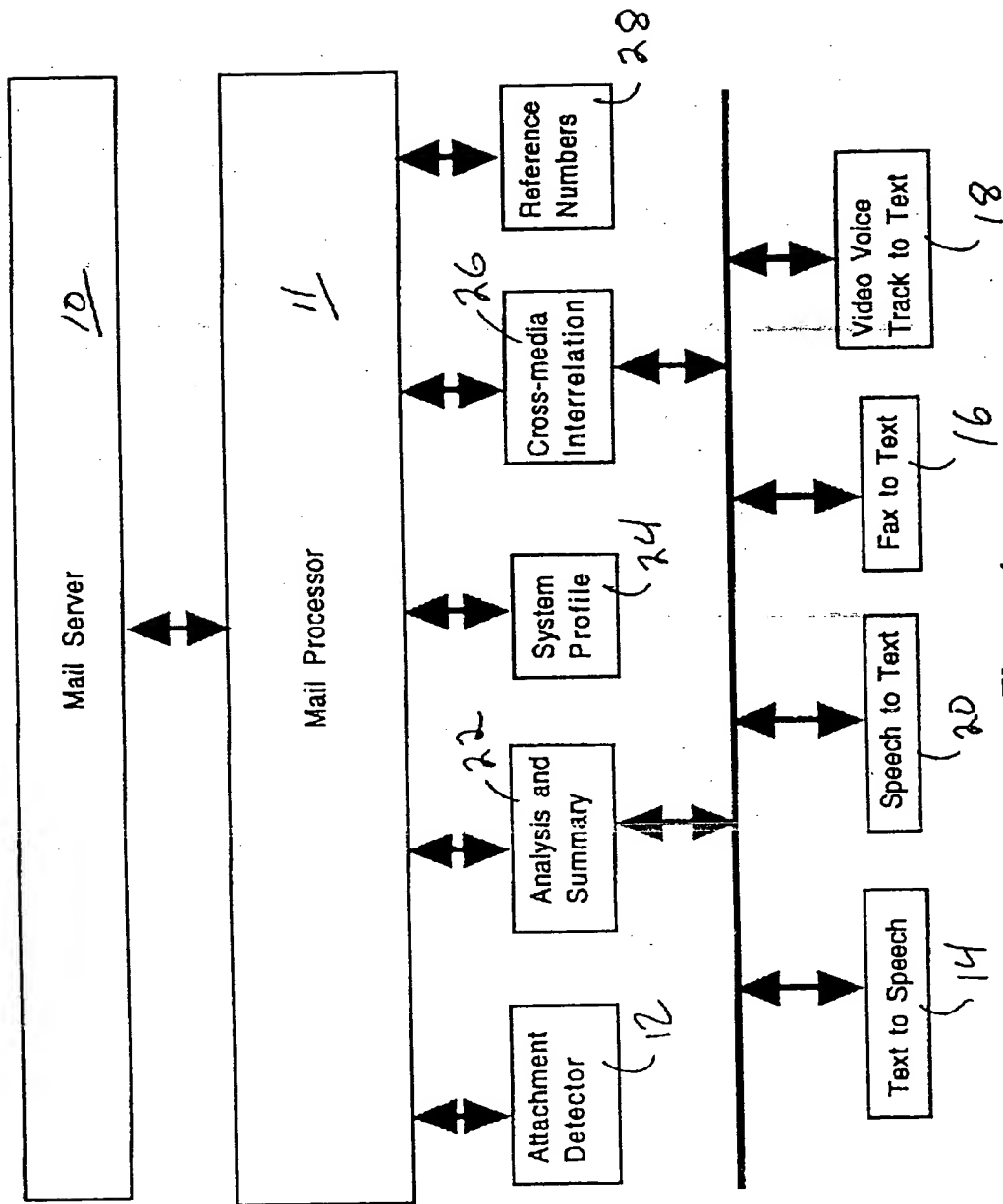


Figure 1

DECLARATION FOR PATENT APPLICATION & POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**METHODS AND APPARATUS FOR ACCESSING AND PROCESSING
MULTIMEDIA MESSAGES STORED IN A UNIFIED MULTIMEDIA MAILBOX**

the specification of which (check one)

X is attached hereto.

— was filed on _____ as Application Serial No. _____

and was amended on _____ (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations § 1.56.

I hereby claim foreign priority benefits under Title 35, United States Codes, § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

PRIOR FOREIGN APPLICATION(S)			Priority claimed	
(Number)	(Country)	(Day/month/year filed)	Yes	No

I hereby claim the benefits under Title 35, United States Code, § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international

filing date of this application:

(Application Serial No.)	(Filing date)	(Status) (patented,pending,abandoned)
--------------------------	---------------	--

(Application Serial No.)	(Filing date)	(Status) (patented,pending,abandoned)
--------------------------	---------------	--

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application listed below:

(Application Serial No.)	(Filing date)	(Status)
--------------------------	---------------	----------

Power of Attorney: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name and registration number)

Adel A. Ahmed, Reg. No. 29,606; I. Marc Asperas, Reg. No. 37,274; Stanton C. Braden, Reg. No. 32,556 Alexander J. Burke, Reg. No. 40,425; Joseph S. Codispoti, Reg. No. 31,819; Henry J. Groth, Reg. No. 39,696; Tracy L. Hurt, Reg. No. 34,188; Mark H. Jay, Reg. No. 27,507; Brian K. Johnson, Reg. No. 46,808; Stuart P. Kaler, Reg. No. 35,913; Rosa S. Kim, Reg. No. 39,728; Peter A. Luccarelli Jr., Reg. No. 29,750; James M. Markarian, Reg. No. 31,277; Jeffrey P. Morris, Reg. No. 25,307; Pasquale Musacchio, Reg. No. 36,876; John Musone, Reg. No. 44,961; Frank J. Nuzzi, Reg. No. 42,944; Donald B. Paschburg, Reg. No. 33,753; Laura M. Slenzak, Reg. No. 35,363; Daniel J. Staudt, Reg. No. 34,733; Erik C. Swanson, Reg. No. 40,194; Heather S. Vance, Reg. No. 39,033; Michael J. Wallace, Reg. No. 44,486

Send correspondence to:

Siemens Corporation
Intellectual Property Department
186 Wood Avenue South
Iselin, N.J. 08830


Direct telephone calls to:

Elsa Keller
Legal Administrator (732) 321-3026

I hereby declare that all statements made herein on my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made

are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the State Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Full name of first joint inventor: Christoph A. Aktas

Inventor's signature: 

Date: 4/30/01

Residence:

~~Sunnyvale, CA~~ Kühbacher Weg 1, D-86154 Augsburg
Germany

Citizenship:

Germany

Post Office Address:

Kühbacher Weg 1, D-86154 Augsburg
~~992 Planetree Place, Sunnyvale, CA 94086~~

Full name of first joint inventor:

John W. Yates

Inventor's signature: _____

Date: _____

Residence:

Mountain View, CA

Citizenship:

USA

Post Office Address:

106A Kittoe Drive, Mountain View, CA 94043

are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the State Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Full name of first joint inventor: Christoph A. Aktas

Inventor's signature: _____

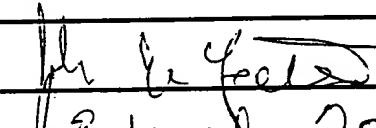
Date: _____

Residence: Sunnyvale, CA

Citizenship: Germany

Post Office Address: 992 Planetree Place, Sunnyvale, CA 94086

Full name of first joint inventor: John W. Yates

Inventor's signature: 

Date: 13 March 2001

Residence: Mountain View, CA

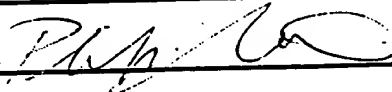
Citizenship: USA

Post Office Address: 106A Kittoe Drive, Mountain View, CA 94043

Full name of first
joint inventor:

Phillip C. Meredith

Inventor's signature:



Date:

3/3/01

Residence:

Palo Alto, CA

Citizenship:

USA

Post Office Address:

459 Homer Avenue #6, Palo Alto, CA 94301

FORM PTO-1595

(Rev. 6-93)

OMB No. 0651-0011 (exp. 4/94)

RECORDATION FORM COVER SHEET
PATENTS ONLY

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

Attorney Docket: 2001 P 08524 US

To the Honorable Commissioner of Patents and Trademarks: Please record the attached original documents or copy thereof.

1. Name of conveying party(ies):

Christoph A. Aktas, John W. Yates and Phillip C. Meredith

Additional name(s) of conveying party(ies) attached? ☐ Yes ☒ No

3. Nature of conveyance:

☒ Assignment☐ MergerExecution Date(s): April 30, 2001, March 3, 2001 and March 3, 2001 respectively

2. Name and address of receiving party(ies)

Name: SIEMENS INFORMATION AND COMMUNICATION NETWORKS, INC.Internal Address: Intellectual Property DepartmentStreet Address: 900 Broken Sound ParkwayCity: Boca Raton State: FL ZIP: 33487Additional name(s) & address(es) attached? ☐ Yes ☒ No

4. Application number(s) or patent number(s):

If this document is being filed together with a new application, the execution date of the application is: April 30, 2001, March 3, 2001 and March 3, 2001 respectively

A. Patent Application No.(s)

B. Patent No.(s)

Additional numbers attached? ☐ Yes ☒ No

5. Name and address of party to whom correspondence concerning document should be mailed:

Name: Elsa Keller

Internal Address: _____

Siemens CorporationIntellectual Property DepartmentStreet Address: 186 Wood Avenue SouthCity: Iselin State: NJ ZIP: 088306. Total number of applications and patents involved: 17. Total Fee (37 CFR 3.41) \$ 40.00☐ Enclosed☒ Authorized to be charged to deposit account

8. Deposit Account No.

19-2179

DO NOT USE THIS SPACE

9. Statement and signature

To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document.

Tracy L. Hurt reg. no. 34,188

Name of person signing

Signature

Date

Total number of pages including cover sheet, attachments, and document: 5

ASSIGNMENT

For good and valuable consideration, we, **Christoph A. Aktas** residing at 992 Planetree, Sunnyvale, CA 94086, citizen of Germany, **John W. Yates** residing at 106A Kittoe Drive, Mountain View, CA 94043, citizen of USA, and **Phillip C. Meredith** residing at 459 Homer Avenue #6, Palo Alto, CA 94301, citizen of USA

Hereby sell, assign and transfer to **SIEMENS INFORMATION AND COMMUNICATION NETWORKS, INC.**, a corporation of the State of Delaware, having a principal place of business at 900 Broken Sound Parkway, Boca Raton, FL 33487, hereinafter "Assignee", its successors, assigns and legal representatives, the entire right, title and interest in and for the United States and all foreign countries, in and to any and all improvements which are disclosed in the application for United States Letters Patent, which has been executed by the undersigned concurrently herewith, and is entitled:

METHODS AND APPARATUS FOR ACCESSING AND PROCESSING MULTIMEDIA MESSAGES STORED IN A UNIFIED MULTIMEDIA MAILBOX

and in and to said application and all divisional, continuing, substitute, renewal, reissue, and all other applications for Letters Patent which have been or shall be filed in the United States and all foreign countries on any of said improvements; and in and to all original and reissued patents which have been or shall be filed in the United States and all foreign countries on said improvements;

Agree that said Assignee may apply for and receive Letters Patent for said improvements in its own name; and that, when requested, without charge to but at the expense of said Assignee, its successors, assigns and legal representatives, to carry out in good faith the intent and purpose of this assignment, the undersigned will execute all divisional, continuing, substitute, renewal, reissue, and all other patent applications on any and all said improvements; execute all rightful oaths, assignments, powers of attorney and other papers; communicate to said Assignee, its successors, assigns, and legal representatives, all facts known to the undersigned relating to said improvements and the history thereof; and generally do everything possible which said Assignee, its successors, assigns or legal representatives shall consider desirable for aiding in securing and maintaining proper patent protection for said improvements and for vesting title to said improvements and all applications for patents and all patents on said improvements, in said Assignee, its successors, assigns and legal representatives; and

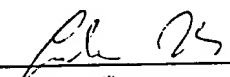
Covenant with said Assignee, its successors, assigns and legal representatives that no assignment, grant, mortgage, license or other agreement affecting the rights and property herein conveyed has been made to others by the undersigned, and that full right to convey the same as herein expressed is possessed by the undersigned.

ACKNOWLEDGEMENTS




Christoph A. Aktas

Witness No. 1:

By: 
Printed Name: Dr. GUENTER HEAS

Date: 4/30/01

Witness No. 2:

By: 
Printed Name: Dr. Wolfgang Behm

Date: 4/30/01

John W. Yates

Witness No. 1:

By: _____
Printed Name: _____

Date: _____

Witness No. 2:

By: _____
Printed Name: _____

Date: _____

Covenant with said Assignee, its successors, assigns and legal representatives that no assignment, grant, mortgage, license or other agreement affecting the rights and property herein conveyed has been made to others by the undersigned, and that full right to convey the same as herein expressed is possessed by the undersigned.

ACKNOWLEDGEMENTS

Christoph A. Aktas

Witness No. 1:

By: _____
Printed Name: _____

Date: _____

Witness No. 2:

By: _____
Printed Name: _____

Date: _____

John W. Yates

Witness No. 1:


By: Mary Buttrick
Printed Name: Mary Buttrick

Date: March 3, 2001

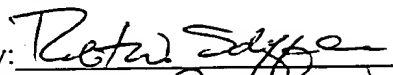
Witness No. 2:

By: Charles E Yates
Printed Name: Charles E Yates

Date: 3/3/01



Phillip C. Meredith

Witness No. 1:

By: 
Printed Name: ROBERT W. SCHEFFER

Date: 3/3/01

Witness No. 2:

By: 
Printed Name: Robin Parker Meredith

Date: 3-3-01